

Axient Case Study: Delivering Digital Transformation to Space Systems Command

Executive Summary

Anticipating and meeting the highest quality end-user experience with lightning-fast speed and security is a collective given in digital services. Insert the Warfighter as the end-user, implement the “together is better” mindset of collaboration across all technology and business domains, and a true culture of digital innovation emerges. That is the vision and mission for U.S. Space Force (USSF) and Space Systems Command (SSC) data management and code development. A seamless, integrated digital thread powering a cloud-based digital engineering and DevSecOps environment creates the opportunity to demand the best from collaborators. Ensuing innovation enables: effective management of multiple ground systems data and models; tactical source code development; model and simulation (M&S) systems; analysis tools; and tactical deployed systems data and models.

Axient invests in and utilizes physical and virtual facilities, as well as partnerships and collaborations to deliver Space Ground Systems innovation from anywhere. Resolute in the pursuit of meeting increasingly higher expectations from Warfighters and all end-users, Axient’s synergistic relationships with advanced global technology partners foster interaction within the SSC community. Axient is developing an intuitive DevSecOps environment with a cloud-based, integrated digital thread and digital engineering capable of managing multiple Ground Systems data and models, tactical source code development, M&S, analysis tools, and tactical deployed systems data and models. We are utilizing this integrated digital engineering and DevSecOps approach to enable SSC to maintain Continuous Integration, Continuous Delivery, and Continuous Deployment (CI/CD) prototypes for a Systems of Systems (SoS) to support USSF, SSC, and DoD capabilities.

IMPLEMENTATION OF DIGITAL TRANSFORMATION COMPARED TO TRADITIONAL SYSTEMS ENGINEERING (SE)

Compared with current SE practice, major differences include but are not limited to:

- Continuous monitoring through a Single Source of Truth (SST) requires data to be shared among stakeholders in the system lifecycle; the need for paper contract data requirements list (CDRL) artifacts and large-scale design reviews is redefined and eventually eliminated
- Design is integrated and validated in models before full physical system development using set-based design and multidisciplinary design, analysis, and optimization (MDAO)
- Mission effectiveness optimization is performed using continuous feedback from the SST
- Requirements become tradeable to enhance key performance parameters
- Analysis of Alternatives (AoA) is conducted with reusable high fidelity models
- Users are trained using AI-instruction with models to support the training of the algorithms
- Testing is automated in a virtual environment to improve operational testing, reducing risk and cost



The Value of Digital Transformation with Axient

Through Digital Transformation, we have accelerated our ability to deliver capabilities faster to the customer and ultimately the warfighter through the following:

- Improved acquisition – Digital deliverables have improved SSC’s understanding of Ground Systems of Systems status and risk along with allowing a project to validate the contractor’s deliverables.
- Improved efficiency and effectiveness – An SST reduces time and effort in the performance of existing tasks.
- Improved communication with stakeholders; better trade-space exploration; reduced risk – Using ontology-based information models to translate and extract useful information among a variety of models and model types allows for improved communication among specialists. This has enabled SSC’s goal to establish a supporting infrastructure and environment to perform activities, collaborate and communicate across stakeholders.
- Improved designs and resulting systems and solutions – Being able to understand the impact of requirements and/or design decisions early has improved the overall system design and identified adverse consequences of the design before committing to a design choice. This has enabled SSC’s goal to formalize the development, integration, and use of models to inform enterprise and program decision-making through an authoritative source of truth (ASoT).

Digital Transformation:
Technology is the tool. People
are the focus. More value is
the outcome.



About Axient

With over 2,200 employees, Axient is headquartered in Huntsville, Alabama and has provided premier services and solutions to the Federal Government for more than three decades. Axient’s customers include the U.S. Space Force, U.S. Air Force, U.S. Army, U.S. Navy, Missile Defense Agency, and NASA. Axient is certified in the following: ISO 9001:2015, AS9100 Rev D, CMMIDEV Maturity Level 3, and has a DCMA Purchasing System, DCMA Property System, and DCAA Accounting System.